

# Recent and Proposed Changes to The National Ambient Air Quality Standards

Environmental Management Systems  
Industry Group Workshop

September 14, 2011

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IowaDNR

The Iowa Department of Natural Resources



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# Overview

- **Air Quality Standards Overview**
- **Frequently Used Terms**
- **NAAQS Implementation**
- **Lead (Pb)**
- **Fine Particles (PM<sub>2.5</sub>)**
- **Nitrogen Dioxide (NO<sub>2</sub>)**
- **Sulfur Dioxide (SO<sub>2</sub>)**
- **Ozone**
- **Discussion**

# Air Quality Standards

- **Clean Air Act**

- Requires the U.S. EPA to establish health based standards for criteria pollutants
- Called National Ambient Air Quality Standards (NAAQS)

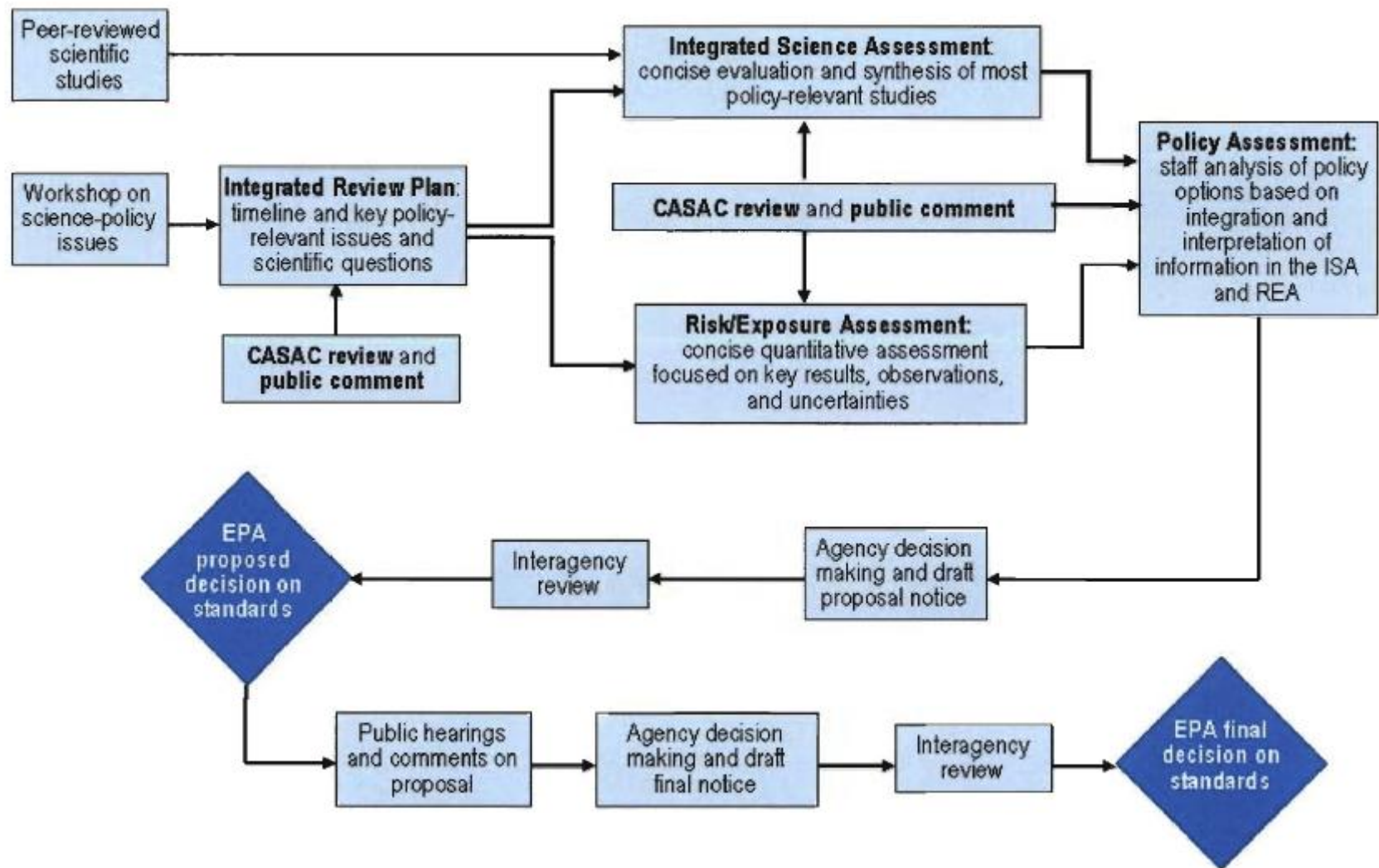
- Establishes maximum concentrations of pollutants that are acceptable in the general air we breathe
  - Primary NAAQS: Protect public health with margin of safety
  - Secondary NAAQS: Protect public welfare, including soil, crops, and vegetation

# Air Quality Standards (cont.)

- **Six criteria pollutants**
  - Ground-level ozone (O<sub>3</sub>)
  - Particulate Matter (PM)
  - Nitrogen Dioxide (NO<sub>2</sub>)
  - Sulfur Dioxide (SO<sub>2</sub>)
  - Carbon Monoxide (CO)
  - Lead (Pb)
- **Particulate matter broken into two size fractions, PM<sub>10</sub> & PM<sub>2.5</sub>**
  - Fractions measured in microns

# New NAAQS review process

April 2009





**Wood-Burning Stoves**



**Forest Fires**



**Heavy Duty Diesel Engines**



**Natural Sources**

Many different sources  
contribute to  
air pollution



**Cars and Trucks**



**Non-Road Vehicles**

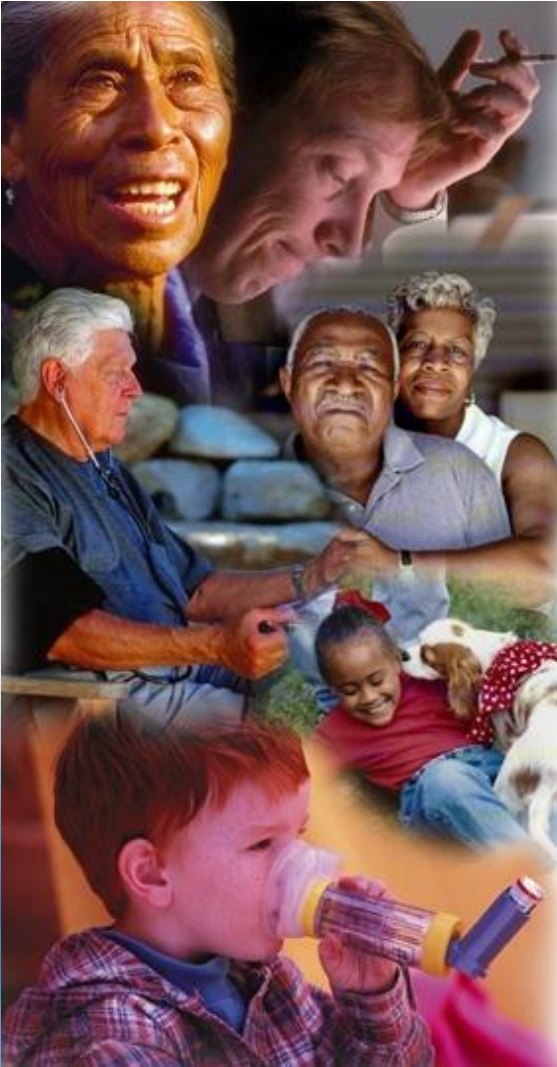


**Leaf Burning**



**Industrial Sources**

# Some Groups Are More at Risk



- **People with heart or lung disease**
  - Conditions make them vulnerable
- **Older adults**
  - Greater prevalence of heart and lung disease
- **Children**
  - More likely to be active
  - Breathe more air per pound
  - Bodies still developing

# Frequently Used Terms

## ■ **Exceedance**

- The level of the standard has been exceeded

## ■ **Violation**

- The “design value” is over the standard. Each standard often allows for numerous “exceedances” of the value before a violation occurs.
- The design value is a calculated value based on actual monitoring data.
- The design value is compared to the standard.
  - Example: the fine particulate (PM<sub>2.5</sub>) standard is violated if the 3 year average of the 98<sup>th</sup> percentile of 24-hour concentrations exceeds the 24-hour standard.

# Frequently Used Terms (cont.)

## ■ Designation

- Classification given by EPA of the air quality in an area. Normally based on monitoring data.

Designation	Classification
Attainment	- Any area that meets the primary & secondary NAAQS
Nonattainment	- Any area that does not meet the NAAQS - Or an area that contributes to a nearby area which does not meet the NAAQS
Unclassifiable	- No or insufficient data - Generally, functionally equivalent to attainment (SO <sub>2</sub> implementation approach may differ)

# Frequently Used Terms (cont.)

- **State Implementation Plan (SIP)**
  - **Documentation that shows how a state will meet federal requirements**
    - Developed by state and local air quality agencies
    - SIPs are a collection of regulations and planning/technical/supporting documents that States use to address various Clean Air Act requirements
    - Approved by EPA, federally enforceable
  - **An infrastructure SIP is required any time a NAAQS is revised (or a new NAAQS is developed)**
    - Demonstrate ability to fulfill the CAA 110(a)(2) elements (enforceable emission limitations, permitting/modeling, enforcement program, ambient monitoring program, adequate personnel, resources, and legal authority, etc.)

# NAAQS Implementation Timeframes

- **When a new/revised NAAQS is promulgated, implementation timeframes (up to) are prescribed by the Clean Air Act**
  - **EPA's Designations:** 2 years after NAAQS promulgation  
(1 yr ext. possible)
  - **Infrastructure SIP Due:** 3 years after NAAQS promulgation
  - **Nonattainment SIP Due:** 3 years after NA designations\*
  - **Attainment Date:** 5 years after NA designations\*\*

\*18 months for lead, sulfur dioxide, and nitrogen dioxide

\*\*Depending upon classification or severity times may be extended (or accelerated)

# State Law Impacts: Iowa Code 455B.134(14)

House File 2418, signed by Gov 4/7/2010



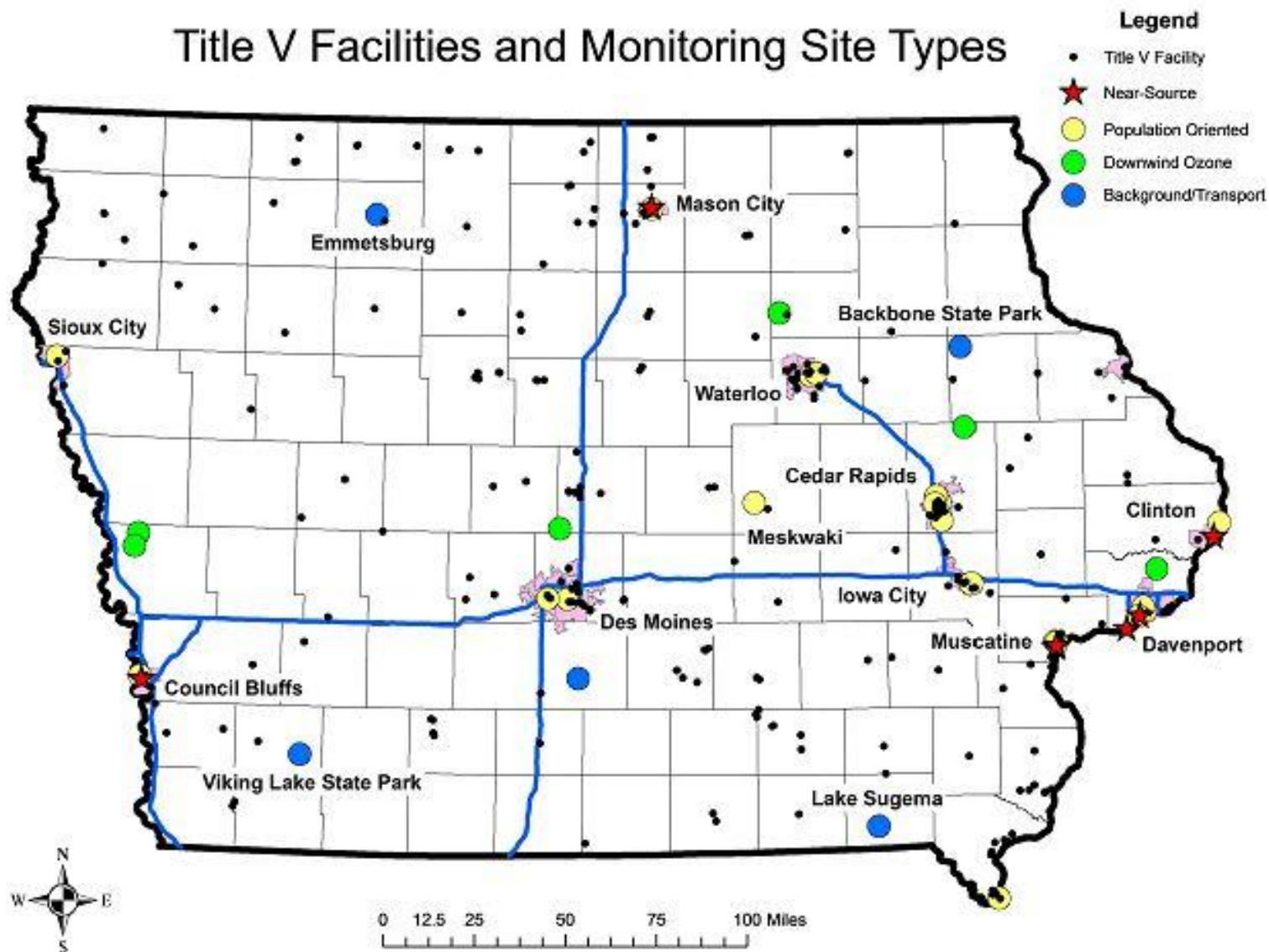
- **New or revised NAAQS**
  - **Convene meetings no later than June 1 during the second calendar year following EPA adoption of a new or revised NAAQS**
    - Re: Review emissions limitations
  - **By November 1 of same year: Submit report to Governor and General Assembly with law change recommendations necessary for attainment of new or revised NAAQS**

# **Nonattainment Implications**

- **Air is not always healthy to breathe**
- **More stringent major source permitting requirements**
  - **Install most stringent emissions controls achievable**
  - **Increases in emissions must be offset with emissions reductions elsewhere in the nonattainment area**
- **State must submit plan to EPA detailing how attainment will be achieved, could include**
  - **Case-by-case emissions reductions strategies**
  - **New rules, such as stricter emissions standards**
  - **Reductions from smaller sources, if cumulative improvements**
- **Potential sanctions for failing to submit SIP within the appropriate timeframe**
- **Effects economic development**

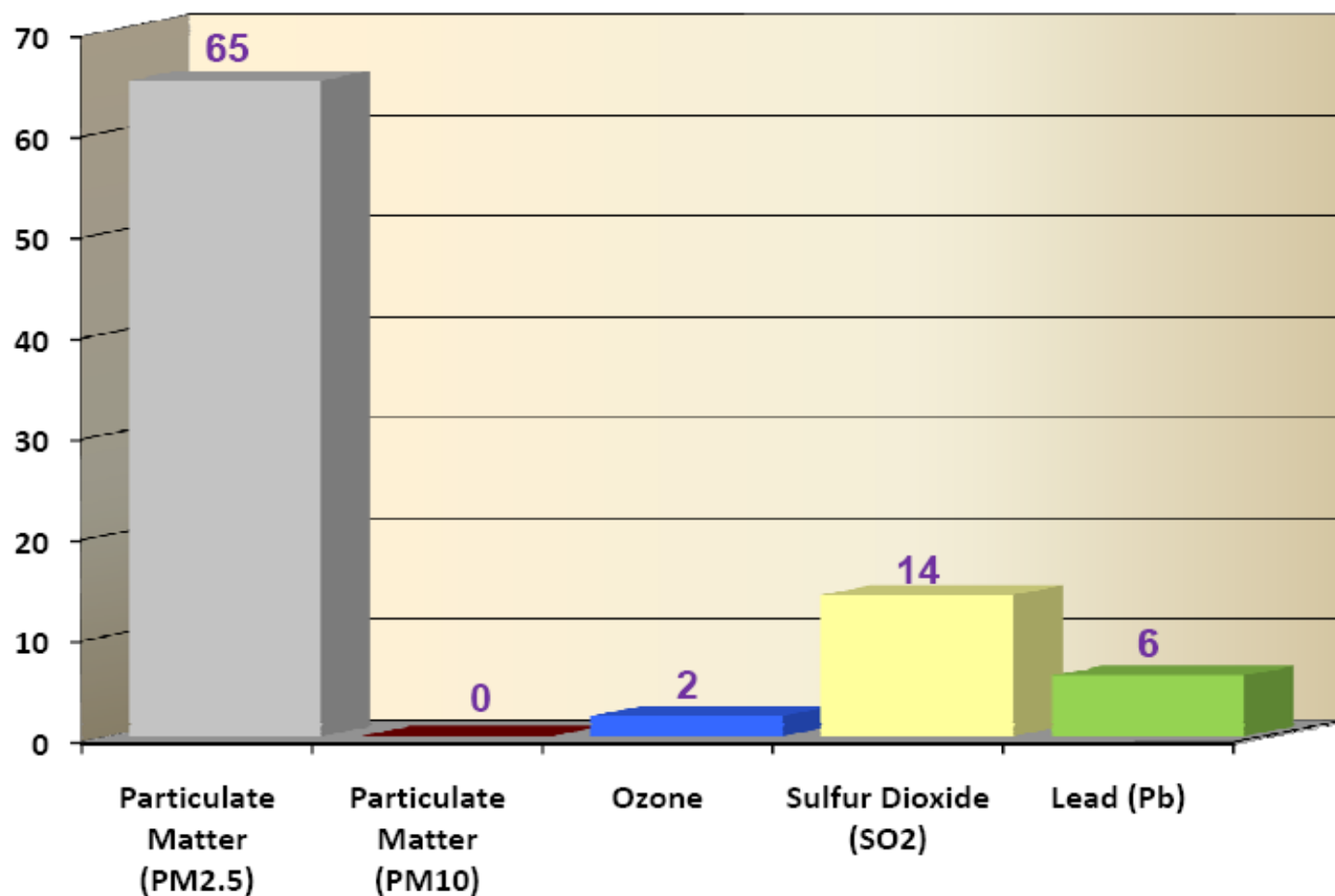
# Where do we monitor?

## Title V Facilities and Monitoring Site Types



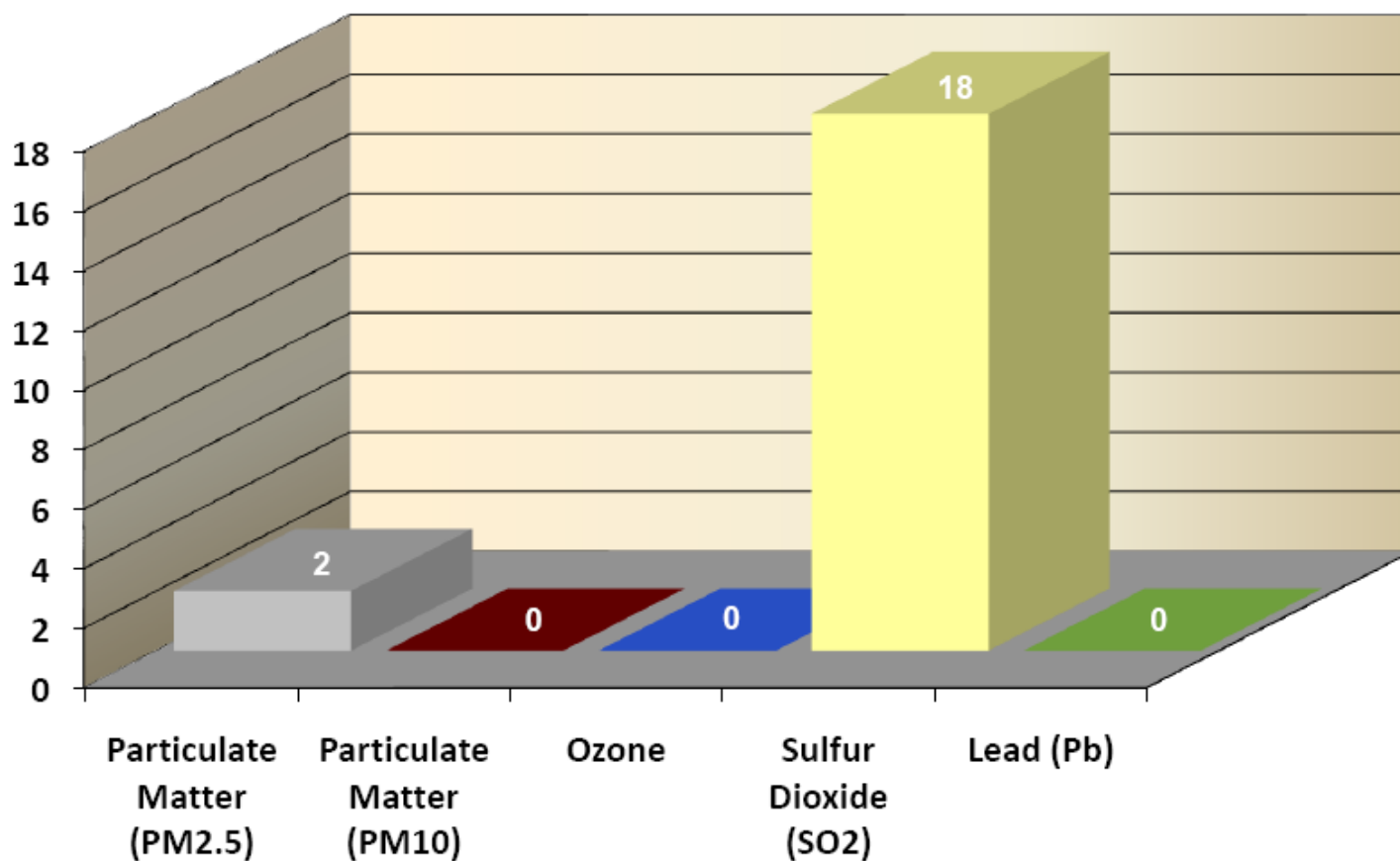
# Iowa NAAQS Exceedances, 2010

(reported through February 10<sup>th</sup>, 2011)



# Iowa NAAQS Exceedances, 2011

(reported through July 28<sup>th</sup>, 2011)



# EPA's Lead Standards: Old & New

Lead Health Standards*	1978 Standards		2008 Standards	
	Level:	1.5 ug/m3	Level	0.15 ug/m3
	Form:	Average concentration in a calendar quarter**  No averages over 1.5 ug/m3 allowed (not to be exceeded)	Form:	Rolling 3-month average  No averages over 0.15 ug/m3 allowed (not to be exceeded)

- **Atmospheric lead measured in total suspended particulates (TSP)**
  - Any particulate matter (PM) suspended in the atmosphere and measured by a PM-TSP sampler

\*The secondary standard has been set to be identical to the primary standard

\*\*Calendar quarters: Jan-Mar, April-Jun, Jul-Sep, Oct-Dec.

# **New Lead Monitoring Requirements**

- **EPA's rulemaking to revise the NAAQS also included new monitoring provisions**
  - **Required states to monitor lead sources suspected or known of causing a NAAQS violation**
- **Griffin Pipe Products Company**
  - **The only facility with emissions greater than one ton per year and not eligible for a waiver**
  - **Source oriented monitor started November 3, 2009**

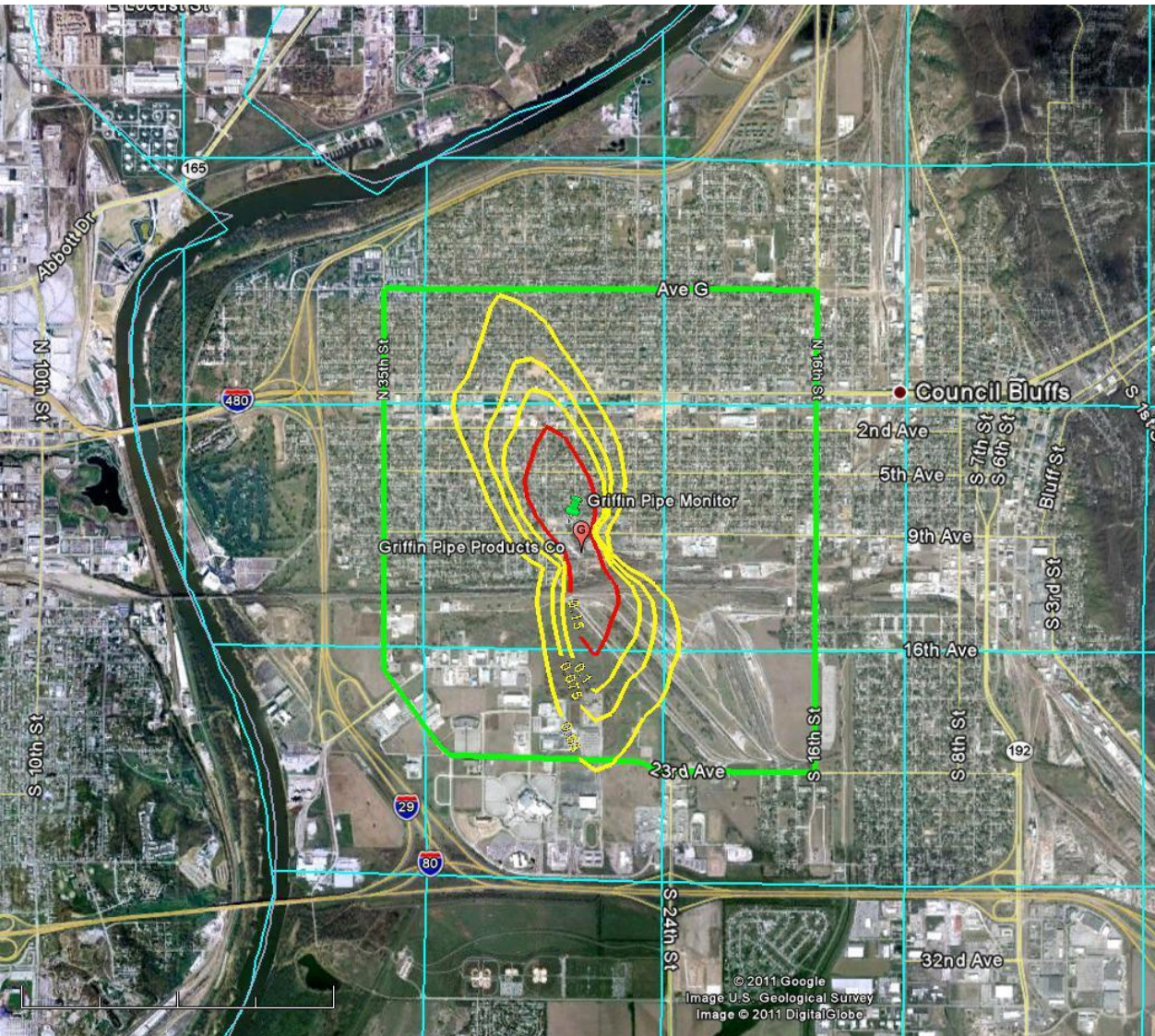
# Griffin Pipe Lead Monitor Data





Time Period	3-Month Rolling Average	Over NAAQS
Nov '09 - Jan '10	0.10	
Dec '09 - Feb '10	0.03	
Jan-Mar (2010)	0.07	
Feb-Apr (2010)	0.12	
Mar-May (2010)	0.14	
Apr-Jun (2010)	<b>0.17</b>	X
May-Jul (2010)	<b>0.20</b>	X
Jun-Aug (2010)	<b>0.26</b>	Maximum
Jul-Sep (2010)	<b>0.24</b>	X
Aug-Oct (2010)	<b>0.25</b>	X
Sep-Nov (2010)	<b>0.18</b>	X
Oct-Dec (2010)	0.14	

## Data:

- November 2009 – December 2010
- 14 months of data= Twelve 3-month rolling averages

# Proposed Boundary



- **Northern Border:**
  - Ave G
- **Southern Border:**
  - 23rd Ave
- **Eastern Border:**
  - N 16th St / S16th St
- **Western Border:**
  - N 35th St / S 35th St
- **Legend:**
  - Proposed Boundary: 
  - Section Lines: 
  - Modeled NAAQS violation : 
  - Modeled Contours: 

# Lead NAAQS Timeline

<b>Mar 2011 ✓</b>	<b>IDNR submits revised lead designation</b>
<b>Jun 2011 ✓</b>	<b>EPA proposes designations &amp; nonattainment boundaries</b>
<b>Jul/Aug ✓</b>	<b>Public/State responses on EPA's proposed boundaries</b>
<b>Oct 2011</b>	<b>EPA issues final designations</b>
<b>~ Dec 2011</b>	<b>Designations become effective</b>
<b>~ Jun 2013</b>	<b>Attainment plan due (nonattainment areas): [Designations Effective + 18 months] Iowa will submit information on reductions already permitted by Griffin Pipe.</b>
<b>~ Dec 2016</b>	<b>Attainment date (nonattainment areas) [Designations Effective + a maximum of 5 years] Must show 36 consecutive 3 rolling three month periods with no violations.</b>

# Particulate Matter: What is It?

A complex mixture of extremely small particles and liquid droplets

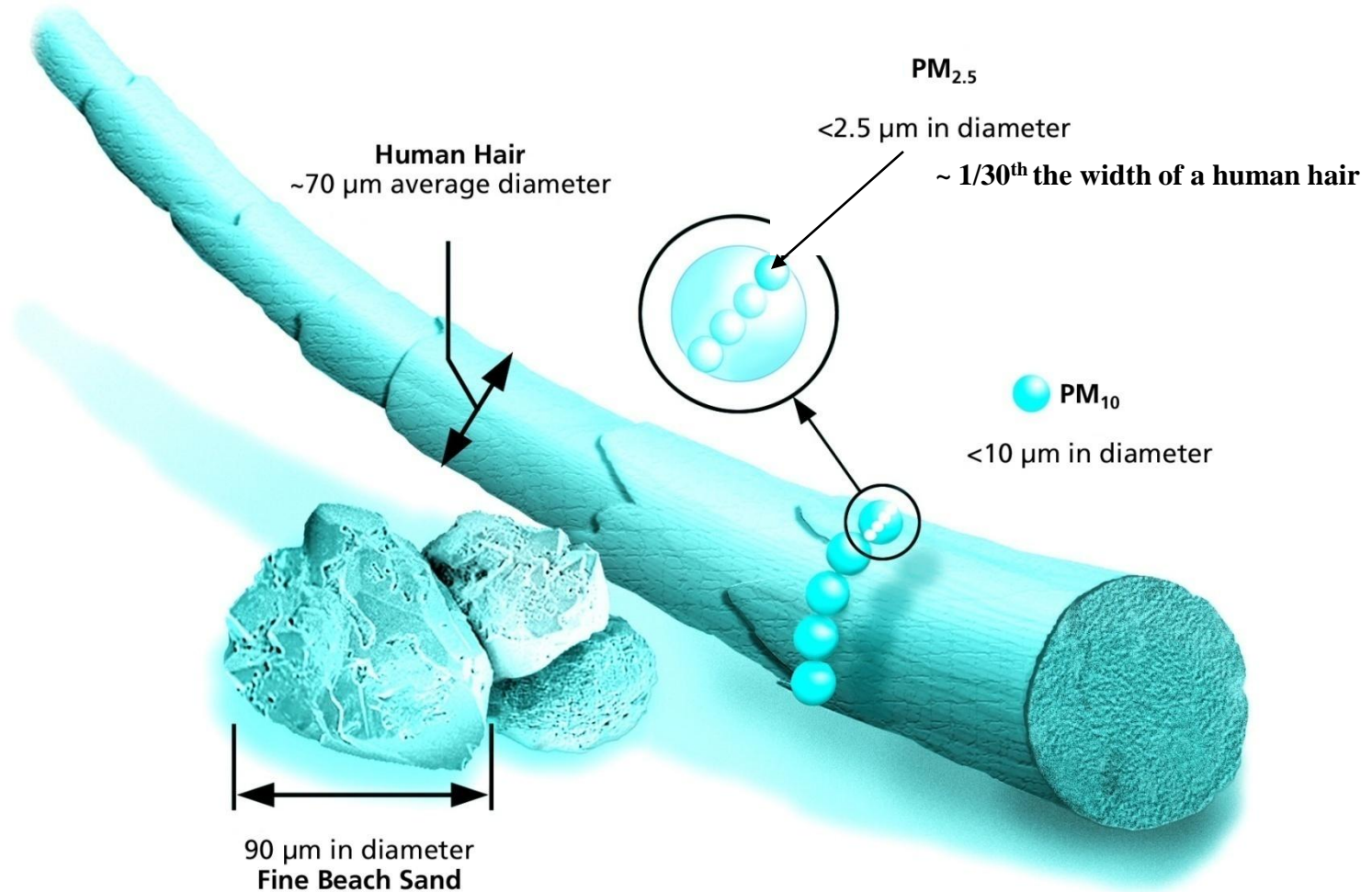


Image courtesy of EPA, Office of Research and Development

# Characteristics of Fine Particulate (PM<sub>2.5</sub>)

## ***Sources: Local & Regional***

- ❖ Direct PM<sub>2.5</sub>: Combustion Coal, oil, gasoline, diesel, wood combustion
- ❖ Secondary PM<sub>2.5</sub>: Transformation of SO<sub>2</sub> and NO<sub>x</sub>

## ***Combustion, particles and gases***

- ❖ Sulfates
- ❖ Nitrates
- ❖ Ammonium
- ❖ Organics
- ❖ Carbon
- ❖ Metals



## ***Exposure/Lifetime:***

- ❖ Lifetime days to weeks
- ❖ Regional distribution over scale to 100s-1000s of miles

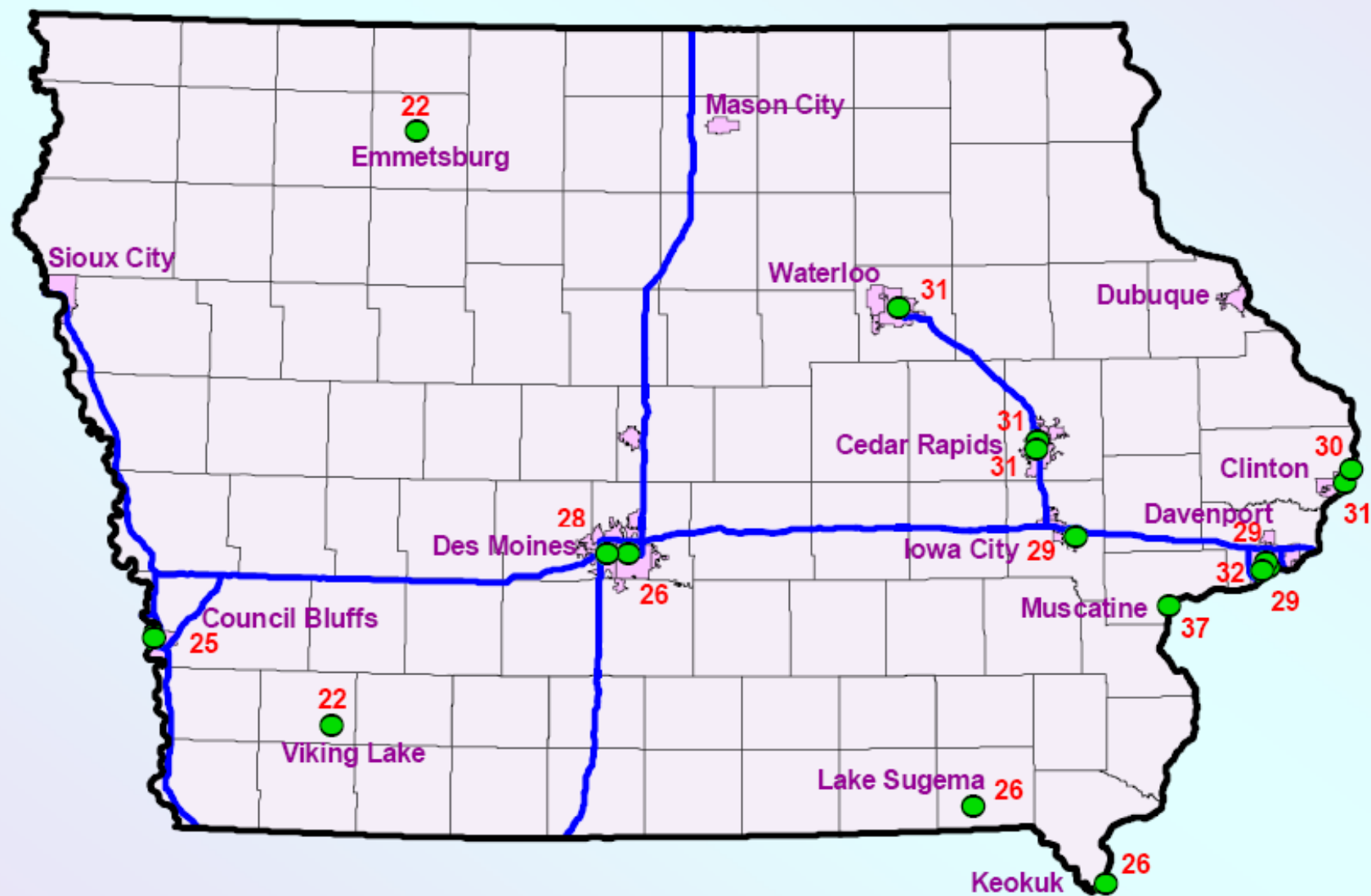
# PM<sub>2.5</sub> Standards

- Fine particulate matter first regulated in 1997
- The 24-hour standard was revised in 2006

	1997 Standards		2006 Standards	
	Annual	24-hour	Annual	24-hour
<b>PM<sub>2.5</sub> (Fine Particles)</b>	<b>15 µg/m<sup>3</sup></b> Annual arithmetic mean, averaged over 3 years	<b>65 µg/m<sup>3</sup></b> 24- hour average, 98 <sup>th</sup> percentile, averaged over 3 years	<b>15 µg/m<sup>3</sup></b> Annual arithmetic mean, averaged over 3 years	<b>35 µg/m<sup>3</sup></b> 24- hour average, 98 <sup>th</sup> percentile, averaged over 3 years

# Iowa PM<sub>2.5</sub> 24-hour Design Values 2008-2010

(NAAQS Standard is 35 µg/m<sup>3</sup>)



# PM2.5 Implementation in Iowa

- **Designations completed**
  - Attainment/unclassifiable
- **PM10 surrogate policy continues**
  - Not applied to PSD projects
- **Rulemaking to adopt PM2.5 PSD rules**
  - Start rulemaking late 2011
    - Significant emission rates and precursors
    - Significant impact levels and increments
    - PM2.5 stack test methods

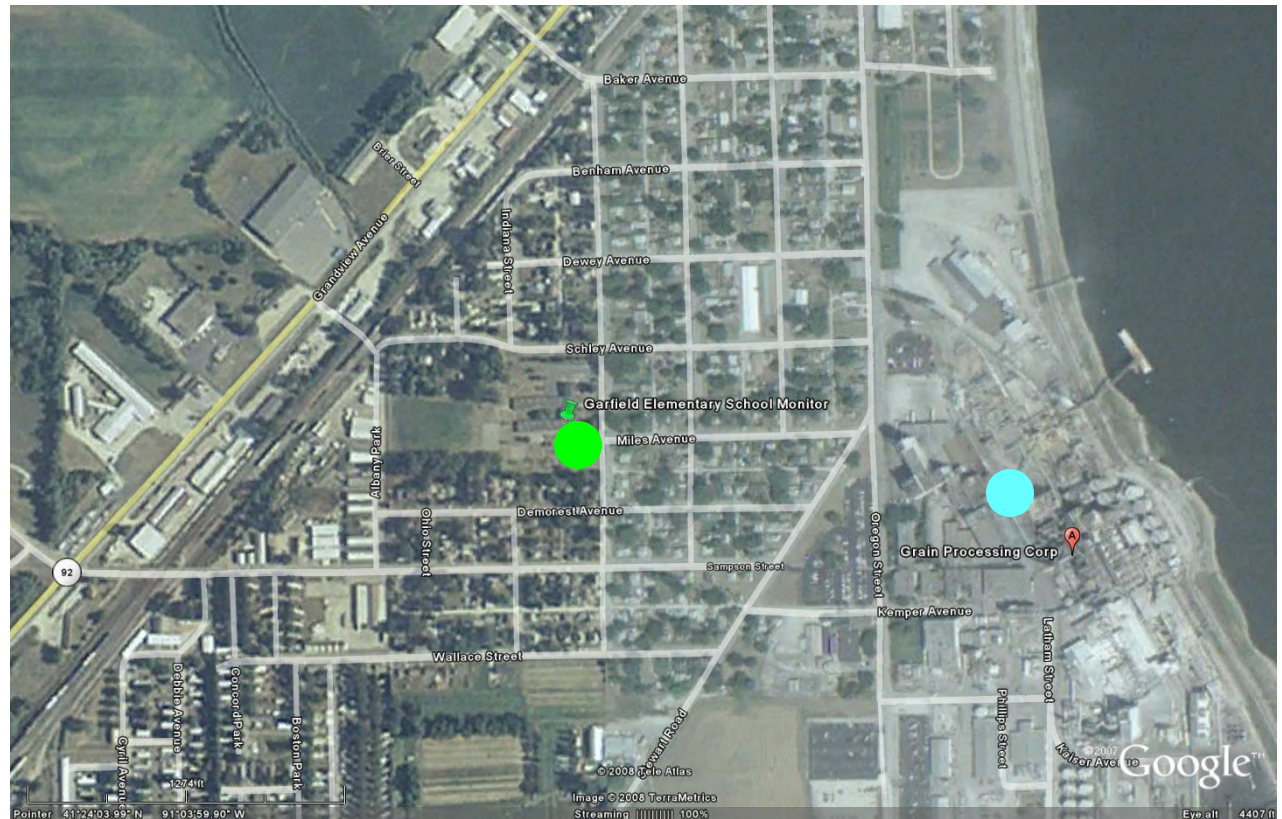


# Federal Implementation Plan (FIP) for PM2.5

- **Suit in Federal Court for EPA's failure to require submissions of Implementation Plans for PM2.5 from States**
- **Sept 8, 2011- EPA published finding that IA has failed to submit PM2.5 infrastructure SIP**
  - Finding will be effective Oct 11, 2011
- **Establishes 24 month deadline for EPA to promulgate a FIP if a SIP is not submitted and approved by deadline**

# Muscatine and PM2.5

- PM2.5 Monitor at Garfield School ●
- Residential & commercial area
- Industrial area 500 m east ●



# Muscatine and PM2.5 (Cont.)

- **Violated with 2005-2007 monitoring data**
  - EPA initially proposed designation of nonattainment
- **Attainment with 2006-2008 monitoring data**
  - EPA designated as attainment in 2009
- **Violating with 2007-2009 and 2008-2010 monitoring data**
- **EPA State Implementation Plan Revision Request (“SIP call”)- Effective August 15, 2011**
- **18 months to submit control strategy for area**
- **No nonattainment designation if violations resolved timely.**

# NO2 NAAQS Update

- **New 1-hr NAAQS promulgated on January 22, 2010**
  - Level: 100 ppb
  - Form: 3 year avg of the 98<sup>th</sup> percentile
  - Retain the current annual standard of 53 ppb
- **State designation recommendations complete**
  - All counties unclassifiable/attainment
- **New monitoring requirements**
  - Near roadway monitors in Metropolitan areas  $\geq 500,000$
  - Des Moines: Monitor operational by January 1, 2013
- **Stakeholder Meetings: Convene by June 1, 2012**
  - Infrastructure SIP due January 22, 2013
- **Permitting and modeling of 1-hr NO2 currently only required for PSD projects**

# SO2 NAAQS Update

- **New 1-hr SO2 NAAQS promulgated on June 2, 2010**
  - Level: 75 ppb
  - Form: 3 year avg of the 99<sup>th</sup> percentile
  - Revocation of 24-hr and annual standards
- **State Designation recommendations complete**
  - Five counties attainment
    - EPA's hybrid monitoring/modeling approach not used for designations
  - Rest unclassifiable
- **EPA guidance or possible rulemaking may result in development of maintenance SIPs for some or all unclassifiable areas**

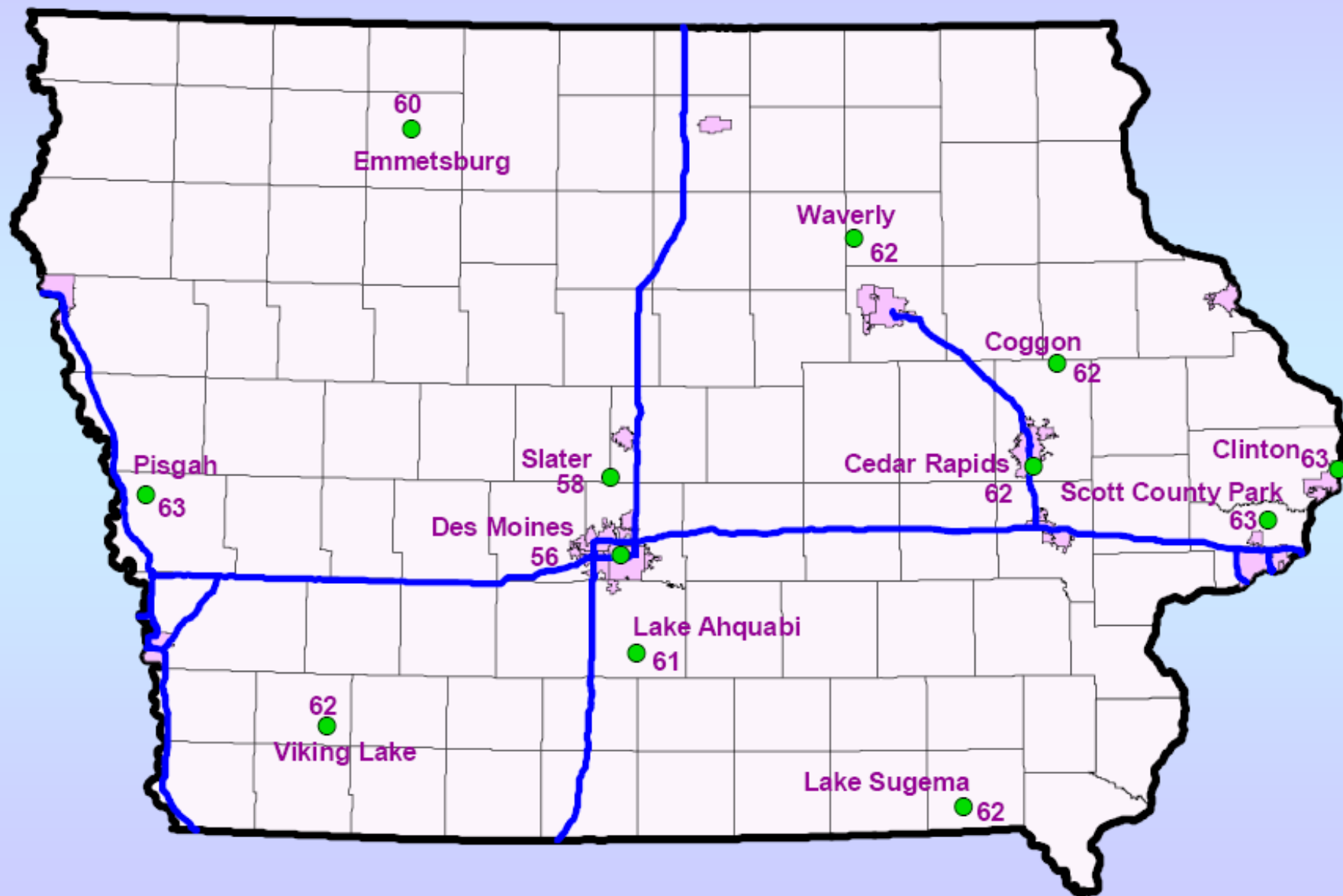
# SO2 NAAQS Update (Cont.)

- **Stakeholder Meetings:**
  - Convene by June 1, 2012
  - Infrastructure SIP due June 2, 2013
- **Permitting and modeling of 1-hr SO2 currently only required for PSD projects**

# Ozone Standard Update

- **Current NAAQS was set in 2008 at 75 ppb (8-hr)**
- **Reconsideration started in 2009 in response to concerns that NAAQS was not protective of public health and environment**
- **EPA proposed range from 60-70 ppb in early 2010**
- **Reconsideration was withdrawn by EPA at request of President on Sept 2, 2011**
- **EPA will review standard in 2013 under CAA timelines**

# Iowa Ozone Design Values: 2008-2010



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**Current Conditions**

Combined AQI Particulate Ozone



Provided by: EPA - AIRNow

**AQI**  
AIR QUALITY INDEX

Good

Moderate

Unhealthy for Sens.

Unhealthy

Very Unhealthy

Hazardous

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**News & Announcements**

[Notification Requirement for Area Source Boiler NESHAP](#) *one hour ago*

This listserv is being sent to inform facilities of an upcoming federal deadline for submittal of an initial notification for a National Emission Standard for Hazardous Air Pollutant (NESHAP). On March 21, 2011, EPA promulgated a NESHAP for boilers at area sources (40 CFR 63 Subpart JJJJJJ, also called the "Area Source Boiler NESHAP"). [read more...](#)

[Ozone Standard to Remain Unchanged](#) *9/2/2011 3:50:00 PM*

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Video 1:40 EPA Administrator Tours Iowa

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# Questions/Discussion